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Sailors (NCCOSC TD 2496, May 1993; Ionospheric Effects Symposium, May 4-6, 1993) reported the probable cause of a discrepancy in the CCIR Report 322-3 radio noise model. The basis for this discrepancy resulted from the procedure used to prepare the measured noise data for the determination of a global numerical representation of the 1 MHz data. In the development of the model, correction factors were determined for each measurement site. These correction factors were interpolated to 100-latitude by 84-longitude grid for each time block/season. The correction factors at each grid point were added to corresponding values for the old CCIR model, and finally the resulting data for each time block and season were numerically mapped.

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A DISCREPANCY IN THE CCIR REPORT 322-3 RADIO NOISE MODEL - A RECOMMENDED SOLUTION

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Sailors (NCCOSC TD 2496, May 1993; Ionospheric Effects Symposium, May 4-6, 1993) reported the probable cause of a discrepancy in the CCIR Report 322-3 radio noise model. The basis for this discrepancy resulted from the procedure used to prepare the measured noise data for the determination of a global numerical representation of the 1 MHz data. In the development of the model, correction factors were determined for each measurement site. These correction factors were interpolated to 100-latitude by 84-longitude grid for each time block/season. The correction factors at each grid point were added to corresponding values for the old CCIR model, and finally the resulting data for each time block and season were numerically mapped.

Nineteen locations were used in the final model. Four sites used in the original CCIR model were not used. As no corrections factors were obtained for these locations or a correction factor of zero used to maintain the status quo, the interpolation algorithm used to obtain the 100-latitude by 84-longitude grid of correction factors supplied other values. For Byrd Station, Antarctica; Ibadan, Nigeria; and Thule, Greenland, the error is at some seasons and time of day serious. Examination of the geographical extent of these errors reveals that the error is not confined to the measurement location but in fact is very large. It was found that the error as a function of frequency is diurnally dependent. The absence of the data locations also affected the accuracy of the interpolation itself.

A recommended course of action to overcome this discrepancy includes (1) obtain correction factors for additional locations to increase the accuracy of the interpolation; (2) test the method of interpolation against a suitable bench mark; (3) Use the Zacharisen and Jones (Institute for Telecomm. Sciences Res. Report 2, 1970) numerical mapping technique applied in local time to develop a new 1-MHz model; (4) consider using a latitude transformation to increase the accuracy of the numerical mapping technique; and (5) submit a corrected model to the CCIR. Additional data include that for the four original locations not utilized in development of CCIR Report 322-3, for four locations from the former Soviet Union (Simferopol, Sverdlovsk, Tbilisi, and Kiev), and for one additional site at Ping-Cheng, Taiwan, China. To use this data it is necessary to remove the effects of man-made noise. Three methods to accomplish this that can be used together or alone are described. Sailors (National Radio Science Meeting, 1983) showed that an improvement in the accuracy of the numerical map can be made by transforming the latitude coordinates so that there is a more uniform variation of atmospheric noise as a function of the modified latitude than there is for the actual latitude. When used with the local-time Zacharisen and Jones mapping technique, it can be expected to work even better in improving the atmospheric noise model than when universal time was used in the mapping technique.